

PATENT ABSTRACTS OF JAPAN

(11)JP publication number : 2000-330858
(43)Date of publication of application : 30.11.2000

(51)Int.Cl.

G06F 12/00
G06T 1/00

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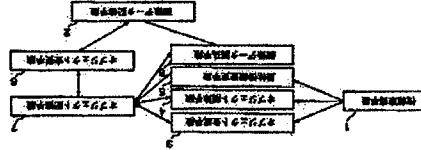
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(54) IMAGE PROCESSOR AND PROGRAM STORAGE MEDIUM

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an image processor capable of efficiently executing the processing of image data.

SOLUTION: The image processor for processing an object having a pair of image data expressing plural images having master and slave relation and image attribute information expressing the attributes of respective images is provided with an object generation means 3 for generating an object by succeeding to the image attribute information of a master object, an object deleting means 4 for deleting also a slave object of an object to be deleted and an attribute information changing means 5 for changing also the attribute of a slave object of an object whose attribute is to be changed.



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CLAIMS

[Claim(s)]

[Claim 1]Plurality by which a link was stretched so that it might become the layered structure form containing child-parent relationship, In an image processing device which deals with an object in an object system which consists of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and this picture, Have an object generating means which newly generates an object, and this object generating means, An image processing device being what sets image attribute information in this parent object as the new object under generation as a default in newly generating an object in which a parent object exists.

[Claim 2]Plurality by which a link was stretched so that it might become the layered structure form containing child-parent relationship, In an image processing device which deals with an object in an object system which consists of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and this picture, It has an attribute changing means to change image attribute information of an established object, An image processing device, wherein this attribute changing means is a thing which makes image attribute information changed about image attribute information of an object of a change target reflect in child objects of this object in changing image attribute information of an object in which child objects exist.

[Claim 3]Plurality by which a link was stretched so that it might become the layered structure form containing child-parent relationship, In an image processing device which deals with an object in an object system which consists of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and this picture, An image processing device being what also deletes child objects of an object for deletion when it has an object deleting means which deletes an established object and this object deleting means deletes an object in which child objects exist.

[Claim 4]In an image processing device which performs Image Processing Division including generation processing of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and this picture, It has a memory measure image attribute information for a default was remembered to be, and an object generating means which generates an object, An image processing device, wherein this object generating means is what sets as a default image attribute information memorized by said memory measure as an object under generation.

[Claim 5]Loading is carried out to a computer system and this computer system, Plurality by which a link was stretched so that it might become the layered structure form containing child-parent relationship. In a program storing medium with which it comes to memorize an image processing program operated as an image processing device which deals with an object in an object system which consists of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and this picture, Said image processing program is provided with an object generating means which newly generates an object, A program storing medium being what sets image attribute information in this parent object as the new object under generation as a default when this object generating means newly generates an object in which a parent object exists.

[Claim 6]Loading is carried out to a computer system and this computer system, Plurality by which a link was stretched so that it might become the layered structure form containing child-parent relationship. In a program storing medium with which it comes to memorize an image processing program operated as an image processing device which deals with an object in an object system which consists of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and this picture, Said image processing program is provided with an attribute changing means to change image attribute information of an established object, A program storing medium, wherein this attribute changing means is a thing which makes image attribute information changed about image attribute information of an object of a change target reflect in child objects of this object in changing image attribute information of an object in which child objects exist.

[Claim 7]Loading is carried out to a computer system and this computer system, Plurality by which a link was stretched so that it might become the layered structure form containing child-parent relationship. Deal with an object in an object system which consists of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and this picture. In a program storing medium with which it comes to memorize an image processing program operated as an image processing device, Said image processing program is provided with an object deleting means which deletes an established object, A program storing medium, wherein this object deleting means is what also deletes child objects of an object for deletion in deleting an object in which child objects exist.

[Claim 8]Loading is carried out to a computer system and this computer system, In a program storing medium which it comes to memorize, an image processing program operated as an image processing device which performs Image Processing Division including generation processing of an object which has a pair with image attribute information showing the attribute of image data showing a picture and this picture said image processing program, A program storing medium which is provided with an object generating means which generates an object, and is characterized by this object generating means being what sets predetermined image attribute information as an object under generation as a default.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the image processing device which performs image processing Division, and the program storing medium which memorizes the program which performs Image Processing Division.

[0002]

[Description of the Prior Art] The digital image data showing pictures, such as a photograph, can take different various attribute contents about each attribute, such as image size, image precision, and a data format.

The image processing device which performs a certain processing to image data, such as generation of image data, deletion, and conversion, according to the attribute contents is known.

For example, when it is required to arrange the size of the picture displayed on a display with certain sizes, such as 320 pixels x 240 pixels, The image processing device provided with the function to change image size is used, and the image data of the size of the above-mentioned regularity is generated by the image processing device based on each image data of two or more various image sizes prepared beforehand. For example, In order to make the handling of image data easy also in the computer in which the performance of CPU (Central Processing Unit) is inferior. The image processing device provided with the function in which image data carries out image precision conversion is used, and the image precision of image data is full color, or it is dropped on 256 color, or, The image processing device provided with the function to change the form of image data so that image data may not press the capacity of a memory is used, and the data format of image data is changed from TIFF by jpeg whose compression ratio is still higher.

[0003]

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[Problem(s) to be Solved by the Invention] However, the conventional image processing device is complicated [management and control of data required for processing of image data or image data], and complicated in order to treat the image data which takes various attribute contents about various attributes in this way. Then, management and control of data are supported, and it is wished when the image processing device which performs efficient image Processing Division processes two or more image data which has various attribute contents especially.

[0004] An object of this invention is to provide the image processing device and program storing medium which perform efficient Image Processing Division in view of the above-mentioned situation.

[0005]

[Means for Solving the Problem] The 1st image processing device of the image processing devices of this invention which attains the above-mentioned purpose, Plurality by which a link was stretched so that it might become the layered structure form containing child-parent relationship, It is what deals with an object in an object system which consists of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and its picture, Have an object generating means which newly generates an object, and the object generating means, In newly generating an object in which a parent object exists, it is characterized by being what sets image attribute information in the parent object as the new object under generation as a default.

[0006] Since this 1st image processing device sets image attribute information of that parent object as image attribute information of an object in which a parent object exists, it can set up efficiently image attribute information showing the attribute of image data.

[0007] The 2nd image processing device of the image processing devices of this invention which attains the above-mentioned purpose, Plurality by which a link was stretched so that it might become the layered structure form containing child-parent relationship, It is what deals with an object in an object system which consists of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and its picture, It has an attribute changing means to change image attribute information of an established object, In changing image attribute information of an object in which child objects exist, the attribute changing means is characterized by being a thing which makes image attribute information changed about image attribute information of an object of a change target reflect in child objects of the object.

[0008] Since this 2nd image processing device makes image attribute information of an object reflect in image attribute information of child objects of that object, it can change image attribute information of an object efficiently to two or more objects especially.

[0009] The 3rd image processing device of the image processing devices of this invention

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which attains the above-mentioned purpose, Plurality by which a link was stretched so that it might become the layered structure form containing child-parent relationship, It is what deals with an object in an object system which consists of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and its picture, It has an object deleting means which deletes an established object, and in deleting an object in which child objects exist, the object deleting means is characterized by being what also deletes child objects of an object for deletion.

[0010]Since this 3rd image processing device deletes both child objects of that object when it deletes an object, it can delete efficiently especially image attribute information and image data which are contained in an object to two or more objects.

[0011]The 4th image processing device of the image processing devices of this invention which attains the above-mentioned purpose, A memory measure performs Image Processing Division including generation processing of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and its picture, and image attribute information for a default was remembered to be, It has an object generating means which generates an object, and the object generating means is characterized by being what sets up as a default image attribute information memorized by object under generation at the above-mentioned memory measure.

[0012]Since this 4th image processing device sets predetermined image attribute information as an object under generation as a default, it can set up efficiently image attribute information showing the attribute of image data.

[0013]The 1st program storing medium of the program storing media of this invention which attains the above-mentioned purpose, Loading is carried out to a computer system and the computer system, Plurality by which a link was stretched so that it might become the layered structure form containing child-parent relationship, Come to memorize an image processing program operated as an image processing device which deals with an object in an object system which consists of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and its picture, and a described image processing program, Have an object generating means which newly generates an object, and the object generating means, In newly generating an object in which a parent object exists, it is characterized by being what sets image attribute information in the parent object as the new object under generation as a default.

[0014]The 2nd program storing medium of the program storing media of this invention which attains the above-mentioned purpose, Loading is carried out to a computer system and the computer system, Plurality by which a link was stretched so that it might become the layered structure form containing child-parent relationship, Come to memorize an image processing program operated as an image processing device which deals with an object in an object

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system which consists of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and its picture, and a described image processing program, It has an attribute changing means to change image attribute information of an established object, In changing image attribute information of an object in which child objects exist, the attribute changing means is characterized by being a thing which makes image attribute information changed about image attribute information of an object of a change target reflect in child objects of the object.

[0015]The 3rd program storing medium of the program storing media of this invention which attains the above-mentioned purpose, Loading is carried out to a computer system and the computer system, Plurality by which a link was stretched so that it might become the layered structure form containing child-parent relationship, Deal with an object in an object system which consists of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and its picture, It is a thing which it comes to memorize an image processing program operated as an image processing device, A described image processing program is provided with an object deleting means which deletes an established object, and in deleting an object in which child objects exist, the object deleting means is characterized by being what also deletes child objects of an object for deletion.

[0016]The 4th program storing medium of the program storing media of this invention which attains the above-mentioned purpose, Loading is carried out to a computer system and the computer system, It is a thing which it comes to memorize an image processing program operated as an image processing device which performs Image Processing Division including generation processing of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and its picture, A described image processing program is provided with an object generating means which generates an object, and is characterized by the object generating means being what sets predetermined image attribute information as an object under generation as a default.

[0017]Each program storing medium from the 1st to the 4th of the program storing media of this invention does so the same operation effect as each image processing device from the 1st to the 4th of the image processing devices of this invention. Although the same name was given to a component with an image processing device and a program storing medium, A device means what built software into hardwares, such as a thing constituted from hardware, or a general-purpose computer, for example, and realized a function as an image processing device of this invention, and a program means the software itself.

[0018]

[Embodiment of the Invention] Hereafter, the embodiment of this invention is described.

[0019]Drawing 1 is the outline view (A) and internal configuration figure (B) of a computer where one embodiment of the image processing device of this invention was realized.

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[0020]As shown in drawing 1 (A) and drawing 1 (B), the computer 20, CPU11, CD-ROM drive 12, the memory 13, the hard disk 14, the mouse 15_1, the keyboard 15_2, and the display 16, it is the computer provided with the usual GUI (graphic user interface) function which the system bath 17 comes to connect. CD-ROM18 which memorized the program used for CD-ROM drive 12 of the computer 20 in the image processing device of this invention is inserted. If this image processing device will be in the state which can be employed and this installed program is started by installing that program on the hard disk 14, this computer system will operate as one embodiment of the image processing device of this invention.

[0021]Therefore, CD-ROM18 the image processing program was remembered to be is equivalent to one embodiment of the program storing medium of this invention.

[0022]Although CD-ROM18 is used as a program storing medium which memorizes the above-mentioned program in the computer 20 shown in drawing 1, The program storing medium of this invention is not what is restricted to CD-ROM. Program storing media, such as the other optical disc, a magneto-optical disc, a floppy disk, and magnetic tape, And internal storage, such as a hard disk drive in the state where the above-mentioned program was installed, is also included, and those program storing media in the state where the image processing program was memorized are also equivalent to one embodiment of the program storing medium of this invention.

[0023]Drawing 2 is a conceptual lineblock diagram of the image processing device with which appearance is shown in drawing 1.

[0024]The image processing device 10 shown in this figure consists of the information acquisition means 1, the image data storing means 2, the object generating means 3, the object deleting means 4, the attribution information alteration means 5, the object alteration means 6, the object memory measure 7, and the image data reading means 8.

[0025]Before explaining the details of the conceptual composition of this image processing device 10, Image Processing Division and an object are explained.

[0026]Image Processing Division here says adding a certain processing to the digital image data showing pictures, such as a photograph. An attribute is changed with the combination of processing with various digital image data. The list of the attributes by which digital image data is characterized is summarized as image attribute information.

[0027]Drawing 3 is a figure showing the kind of attribute contained in image attribute information.

[0028]The image size information which expresses the size of pictures, such as 320 pixels x 240 pixels, to image attribute information, for example, 256 colors (8 bits) and the image precision information [being full color (24 bits)] which expresses the accuracy of the color of a picture like. The attribution information of various kinds, such as compression technology information showing compression technology, such as jpeg, color space information showing

the kind of color space used as the base which specifies a color like RGB or CMYK, and platform information showing the kind of platform forms, such as the Intel form and the Motorola form, is included.

[0029]Drawing 4 is a figure showing the situation where the attribute of digital image data is changed by the conventional image processing device.

[0030]As shown in this figure, when changing the attribute of digital image data, the image attribute information set up in the analysis of that digital image data, etc. is used. As for this digital image data, while a storage location is managed, that storage location and predetermined image attribute information are matched. Conversion of the attribute of this digital image data is faced. They need to be managed by the information about each of data formats, such as TIFF, JPEG, DICOM, and PNG, and the information on each platform form, and the above-mentioned digital image data, Image Processing Division is performed being controlled based on these information, and it is changed into the digital image data and image attribute information which have a new attribute.

[0031]Like attribute conversion of this digital image data, the complicated and complicated management and control according to various attribute contents are needed for Image Processing Division. However, in the image processing device of this embodiment, by the object which has a pair of digital image data and image attribute information being dealt with as a basic unit of Image Processing Division, the above-mentioned management and control are supported and Image Processing Division is efficiently performed so that it may explain below.

[0032]Next, the structure of one object is suitably explained with reference to drawing 5 - drawing 8 with drawing 5.

[0033]Drawing 5 is a figure showing the structure of an object.

[0034]As shown in drawing 5, the object links with the resource information showing digital image data and image attribute information. The details of resource information are shown in drawing 6.

[0035]Drawing 6 is a figure showing an example of the resource information of an object.

[0036]The information on the storage location of digital image data is included in resource information, and the digital image data stored in this storage location is equivalent to the digital image data which this object has. For example, the image size information of the image attribute information, image precision information, compression technology information and color space information, platform information, etc. are included in this resource information. Image attribute information and digital image data are matched by this resource information.

[0037]An object is classified so that it may belong to a group with the same character called a class as shown in drawing 7.

[0038]Drawing 7 is a figure showing an example of a classification of the class of an object.

[0039]As shown in this figure, a class takes a layered structure. Have the layered structure here and the "core class" which is an uppermost hierarchy's class as a class of the hierarchy of the low rank of a "core class", it has the "picture class" which is a class of the object about the picture itself, and the "picture related data classes" containing a histogram, a look-up table, etc. A "picture class" has a "color picture (Colourimage) class", a "general picture (Genericimage) class", and "monochrome picture (Monochromeimage) class" as a low-ranking hierarchy's class.

[0040]If the classes to which an object belongs differ, the kinds of attribute of the image attribute information included in the resource information of an object may differ. However, in the layered structure of this class, a low-ranking hierarchy's class inherits the resource of the class of the hierarchy of a higher rank. That is, the kind of attribute which the image attribute information of the resource information a low-ranking hierarchy's class has includes the kind of attribute which the image attribute information of the resource information of the class of the hierarchy of a higher rank has.

[0041]As shown in drawing 5, the object links with the class information which is information about this class. Class information has a default resource which is the default of resource information to the object belonging to a class name and its class.

[0042]As shown in drawing 5, the object links with the image format peculiar resource showing the information on each of data formats, such as TIFF, JPEG, DICOM, PNG, etc. which are used for control of attribute conversion of digital image data, described by explanation of drawing 4.

[0043]As for an object, other objects and child-parent relationship are set up according to the operation from the outside. The child-parent relationship of an object here is not the child-parent relationship of the class of an object generally known but child-parent relationship of a concrete example (instance) of an object. This child-parent relationship is set up among two or more objects which usually belong to the same class. When this child-parent relationship is set up between objects and a certain object A has one or more child (Descendant) objects, the contents of one or more attributes of the resource information of the object A are inherited by those child objects – those child objects – resource information – the contents of those attributes – the same – it will have the contents of the attribute. For those child objects, the object A is a parent (Parent) object and child objects other than the object B of the object A are brother (Sibling) objects for the one object B in those child objects. The object links with the parent (Parent) object, the child (Descendant) object, and the brother object.

[0044]An object has the information which has an object name for an object to be identified and shows the operating condition of a flag. When a flag is 1, it is shown that this object is in the situation currently used, and, below, it calls it setting a flag as "use" to set a flag to 1. When a flag is 0, even if this object has information, including resource information etc., it is

considered that it is intact and, below, it calls it setting a flag as "intact" to set a flag to 0. [0045]Drawing 8 is a figure showing the situation where the attribute of digital image data is changed by the image processing device of this embodiment.

[0046]In the point that digital image data and image attribute information are surrounded by the box of the solid line together, this figure differs from drawing 4. The box of this solid line expresses an object. The object which the box on the left-hand side of this figure expresses, image attribute information is already set up and the storage location of digital image data is included, image attribute information and the storage location of digital image data are matched as a result, and it links further with the information about the contents of each of data formats, such as TIFF, JPEG, DICOM, and PNG, and the information on each plot form. Although details of the attribute changing of digital image data are given below, in the image processing device of this embodiment, it is that the information currently prepared for the inside of the object mentioned above is referred to, and attribute changing of digital image data is performed by making an object into a unit. Since such an object is used when taking the gestalt of software, the image processing device of this embodiment has the strong point of excelling in the maintenance and extension of a program with which general object oriented programming is provided.

[0047]Now, it returns to explanation of drawing 2 which is a conceptual lineblock diagram of the image processing device 10 using this object. On the occasion of change of the image attribute information included in generation, deletion, and resource information of an object, information, including the attribute contents of the target object name, a class name, a parent object name, and resource information, etc., is acquired by the information acquisition means 1 according to a user's operation. Two or more digital image data is memorized by the image data storing means 2, and two or more objects are memorized at the object memory measure 7.

[0048]The object generating means 3 performs setting out of an object name, a class name, a parent object name, a flag, and resource information based on the information acquired by the information acquisition means 1, and generates an object. The generated object is stored in the object memory measure 7.

[0049]The object deleting means 4 reads the object of the object name used as the candidate for deletion acquired by the information acquisition means 1 from the object memory measure 7, and sets the flag of the object as "intact." The object set as "intact" is stored in the object memory measure 7. However, the object deleting means 4 can also actually delete the object of the object name used as the candidate for deletion according to a user's operation.

[0050]The attribution information alteration means 5 reads the object used as the change target of an attribute which has the object name acquired by the information acquisition means 1 from the object memory measure 7. The predetermined attribute contents of the resource

information of the object are replaced according to the new attribute contents acquired by the information acquisition means 1. The object replaced by the new attribute contents is stored in the object memory measure 7.

[0051]The image data reading means 8 acquires an object name and an image data name from the information acquisition means 1 according to a user's operation. Read the object which has the object name from the object memory measure 7, and the digital image data which has the image data name is further read from the image data storing means 2. The attribute of the digital image data is analyzed and the analyzed attribute contents and storage location of the digital image data are applied to the resource information of the read object. The object which had resource information updated such is stored in the object memory measure 7.

[0052]The object alteration means 6 reads the object A which has digital-image-data A, and the object B which does not have digital image data from the object memory measure 7.

Digital-image-data B which changed the digital image data of the object A according to the object attribute information of the object B is generated, and the object B is changed into the object which has digital-image-data B. The object B is stored in the object memory measure 7.

[0053]The details of the object generation by this image processing device 10, object deletion, and change of the attribute contents of an object are explained below using a flow chart.

[0054]Drawing 9 is a flow chart of object generation.

[0055]At Step S101, the information acquisition means 1 acquires the object name inputted by a user's operation, and the class name of an object. The information acquisition means 1 acquires a parent object name, when a parent object name is inputted by a user's operation, and further, when resource information is inputted by a user's operation, it acquires the resource information. The resource information to acquire may be information about some attributes of the various attributes contained in resource information. Next, it progresses to Steps S102-S106.

[0056]In Steps S102-S106, the object generating means 3 searches the object memory measure 7, and if it judges with the object for generation being the first object, it will newly generate an object. However, in this stage, the concrete contents of various kinds of information as shown in drawing 5 are not included in this object.

[0057]The object generating means 3 searches the child objects of an object with the parent object name from the object memory measure 7, when a parent object name is acquired by the information acquisition means 1. When there are some whose flag is "intact" among the searched child objects, the flag uses "intact" child objects as an object for generation. The case where an object with the acquired parent object name in the object memory measure 7 does not have child objects. Even if it has child objects, when all of the flag of all those child objects are "used", the object generating means 3 generates the child objects of the object

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which newly has the acquired parent object name.

[0058]When the object for generation is not the first object and a parent object name is not acquired by the information acquisition means 1, the object generating means 3. The object memorized by the object memory information 7 is searched, the flag used discovers an "intact" object out of the searched object, and it is used as an object for generation. However, when the object which has an "intact" flag in the searched object does not exist, the object generating means 3 newly generates an object. Next, it progresses to Step S107.

[0059]As opposed to the object which the object generating means 3 generated at Steps S102-S106 in Step S107, The object name acquired by the information acquisition means 1 is set up, an object with the class of the class name acquired from the object memory measure 7 by the information acquisition means 1 is read, and the class information of the read object is set up. The object generating means 3 makes the object of the parent object name acquired by the information acquisition means 1 memorized by the object memory measure 7 link to the object for generation. The flag used of the object for generation is set as "use." Next, it progresses to Steps S108-S110.

[0060]In Steps S108-S110, when the parent object name is not acquired by the information acquisition means 1, the object generating means 3 sets up the default resource in the class information of the object for generation as resource information. Thus, the object to which resource information was set has the resource information of the same contents as this default resource.

[0061]Thus, since the image processing device of this embodiment has the resource

information for a default according to the class to which the object for generation belongs and sets the resource information as the object as default resource information. Resource information is set up efficiently and an object can be generated efficiently.

[0062]When the parent object name is acquired by the information acquisition means 1, the object generating means 3 inherits the resource information of the object of the parent object name, and sets the resource information as the object for generation as a default. Thus, the object to which resource information was set has the resource information of the same contents as the resource information.

[0063]Thus, since the image processing device of this embodiment sets the resource information of the parent object as the object in which a parent object exists as default resource information, it sets up resource information efficiently and can generate an object efficiently.

[0064]Next, it progresses to Step S111.

[0065]In Step S111, when resource information is acquired by the information acquisition means 1, the resource information set up at Steps S108-S110 is in part or all replaced and set up by this acquired resource information. Above, generation of an object is completed.

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[0066]Drawing 10 is a flow chart of object deletion.

[0067]In Step S201, the object name of the object used as the candidate for deletion inputted according to a user's operation is acquired by the information acquisition means 1, and the object of the object name is read from the object memory measure 7 by the object deleting means 4. Next, it progresses to Step S202.

[0068]In Step S202, the flag used of the read object is changed into "it is intact" by the object deleting means 4. Next, it progresses to Steps S203-S204.

[0069]In Steps S203-S204, when the object deleting means 4 judges whether child objects exist in the object for deletion and child objects exist, the flags used of all the child objects are changed into "it is intact." Above, deletion of an object is completed.

[0070]Thus, since the image processing device of this embodiment deletes an object with the child objects of the object. Those objects can be especially deleted efficiently to two or more objects with the image attribute information and the image data which are contained in those objects.

[0071]Drawing 11 is a flow chart of attribute-contents change of an object.

[0072]In Step S301, the object name of the object used as the attribute changing object inputted according to a user's operation is acquired by the information acquisition means 1, and the object of the object name is read from the object memory measure 7 by the attribution information alteration means 5. The resource information which was inputted according to a user's operation and including new attribute contents is acquired by the information acquisition means 1. Next, it progresses to Step S302.

[0073]The above of the resource information of the object from which the attribution information alteration means 5 serves as an attribute changing object read from the object memory measure 7 in Step S302 -- only the portion corresponding to new attribute contents is transposed to the new attribute contents, and is set up. Next, it progresses to Steps S303-S304.

[0074]It is judged whether in Steps S303-S304, child objects exist in the object from which the attribution information alteration means 5 serves as the above-mentioned attribute changing object, reading the child objects of the object which serves as the attribute changing object from the object memory measure 7, when child objects exist -- the resource information of all the child objects -- Step S302 -- the same -- the above -- it transposes to resource information including new attribution information, and is set as it. Above, change of the attribute contents of an object is completed.

[0075]Thus, since the image processing device of this embodiment makes the image attribute information of an object reflect in the image attribute information of the child objects, it can change the image attribute information of those objects efficiently to two or more objects especially.

[0076]Next, the example which changes the size of digital image data is explained using the above-mentioned object generation. Here, the image processing device of this embodiment reads the multiple image of various data formats and various image sizes, and considers the case where the conversion process of all the pictures is collectively carried out to identical image size.

[0077]Drawing 12 is an example of a flow chart which changes the image size of two or more objects.

[0078]Drawing 13 is a figure showing the layered structure of the child-parent relationship of the object used with the flow chart of drawing 12.

[0079]As shown in drawing 12, in Step S401, the object generating means 3 generates the route object a1 shown in drawing 13. A parent object is not set up, but this route object a1 is set up belong to a general picture class, and the default resource of this general picture class is set up as resource information. All the objects used with this flow chart shall be set up belong to a general picture class. Next, it progresses to Step S402.

[0080]Step S402 -- the above -- the object generating means 3 generates the route source object a2 shown in various data formats and drawing 13 used as the parent object of the object which has a multiple image of various image sizes. As for this route source object a2, the route object a1 is set up as a parent object, and resource information inherits the resource information of this parent object. If the resource information in particular of each next object is not refused, it inherits the resource information of each parent object. Next, it progresses to Step S403.

[0081]The above shown in drawing 13 in Step S403 -- the source object a3 which is an object which becomes a basis which reads the multiple image of various data formats or various image sizes is generated only for the predetermined number of pictures by the object generating means 3. As for these source objects a3, the route source object a2 is set up as a parent object. Next, it progresses to Step S404.

[0082]Step S404 -- the image data reading means 8 -- the above -- two or more digital image data of each of various data formats and various image sizes -- the source object a3 from the image data storing means 2 -- it is alike, respectively and is read, thus, the thing for which digital image data is read -- the image data reading means 8 -- the source object a3 -- the image attribute information of the read digital image data is set as the image attribute information in each resource information. Next, it progresses to Step S405.

[0083]In Step S405, the route destination object a4 used as the parent object of two or more digital image data of identical image size shown in drawing 13 is generated by the object generating means 3. This route destination object a4, The route object a1 is set up as a parent object, the image size of the image attribute information included in resource information is set as 320 pixels x 240 pixels, and resource information other than image size inherits the

resource information of a parent object. Next, it progresses to Step S406.
[0084]In Step S406, same number generation of the destination object a5 which is an object used as the basis which reads two or more digital image data of identical image size shown in drawing 13 is carried out by the object generating means 3 with the number of two or more of the digital image data. As for these destination objects a5, the route destination object a4 is set up as a parent object. Next, it progresses to Step S407.

[0085]. The object alteration means 6 is memorized by the object memory measure 7 in Step S407, the destination object a5 -- the object of the couple which received and to which resemble, respectively, and each source object was made to correspond being read in order, and, The digital image data which changed the digital image data of the source object a3 of the objects of the couple according to the image attribute information of the destination object a5 of the objects of the couple is generated, The information on the storage location of the generated digital image data is given and changed into the destination object a5 of the object of the couple. By repeating this change, all the digital image data for conversion is changed into digital image data (320 pixels x 240 pixels). Next, it progresses to Step S408.

[0086]In Step S408, the object deleting means 4 deletes the route object a1. The route source object a2, all the source objects a3, the route destination object a4, and the destination object a5 are deleted with deletion of this route object a1.

[0087]Thus, in the image processing device of this embodiment, by an object unit, digital image data can be dealt with and the conversion process of two or more digital image data can be efficiently carried out using the character succession by the child-parent relationship and class of an object.

[0088]

[Effect of the invention]As explained above, according to the image processing device and program storing medium of this invention, image data can be efficiently processed using the character succession by the child-parent relationship and class of an object.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention]This invention relates to the image processing device which performs Image Processing Division, and the program storing medium which memorizes the program which performs Image Processing Division.

[Translation done.]

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PRIOR ART

[Description of the Prior Art]The digital image data showing pictures, such as a photograph, can take different various attribute contents about each attribute, such as image size, image precision, and a data format.

The image processing device which performs a certain processing to image data, such as generation of image data, deletion, and conversion, according to the attribute contents is known.

For example, when it is required to arrange the size of the picture displayed on a display with certain sizes, such as 320 pixels x 240 pixels, The image processing device provided with the function to change image size is used, and the image data of the size of the above-mentioned regularity is generated by the image processing device based on each image data of two or more various image sizes prepared beforehand. For example, In order to make the handling of image data easy also in the computer in which the performance of CPU (Central Processing Unit) is inferior. The image processing device provided with the function in which image data carries out image precision conversion is used, and the image precision of image data is full color, or it is dropped on 256 color, or, The image processing device provided with the function to change the form of image data so that image data may not press the capacity of a memory is used, and the data format of image data is changed from TIFF by jpeg whose compression ratio is still higher.

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Invention]As explained above, according to the image processing device and program storing medium of this invention, image data can be efficiently processed using the character succession by the child-parent relationship and class of an object.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]However, the conventional image processing device is complicated [management and control of data required for processing of image data or image data], and complicated in order to treat the image data which takes various attribute contents about various attributes in this way. Then, management and control of data are supported, and it is wished when the image processing device which performs efficient Image Processing Division processes two or more image data which has various attribute contents especially.

[0004]An object of this invention is to provide the image processing device and program storing medium which perform efficient Image Processing Division in view of the above-mentioned situation.

[Translation done.]

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MEANS

[Means for Solving the Problem]The 1st image processing device of the image processing devices of this invention which attains the above-mentioned purpose, Plurality by which a link was stretched so that it might become the layered structure form containing child-parent relationship, It is what deals with an object in an object system which consists of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and its picture, Have an object generating means which newly generates an object, and the object generating means, In newly generating an object in which a parent object exists, It is characterized by being what sets image attribute information in the parent object as the new object under generation as a default.

[0006]Since this 1st image processing device sets image attribute information of that parent object as image attribute information of an object in which a parent object exists, it can set up efficiently image attribute information showing the attribute of image data.

[0007]The 2nd image processing device of the image processing devices of this invention which attains the above-mentioned purpose, Plurality by which a link was stretched so that it might become the layered structure form containing child-parent relationship, It is what deals with an object in an object system which consists of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and its picture, It has an attribute changing means to change image attribute information of an established object, In changing image attribute information of an object in which child objects exist, the attribute changing means is characterized by being a thing which makes image attribute information changed about image attribute information of an object of a change target reflect in child objects of the object.

[0008]Since this 2nd image processing device makes image attribute information of an object reflect in image attribute information of child objects of that object, it can change image attribute information of an object efficiently to two or more objects especially.

[0009]The 3rd image processing device of the image processing devices of this invention which attains the above-mentioned purpose, Plurality by which a link was stretched so that it might become the layered structure form containing child-parent relationship, It is what deals with an object in an object system which consists of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and its picture, and its picture, It has an object deleting means which deletes an established object, and in deleting an object in which child objects exist, the object deleting means is characterized by being what also deletes child objects of an object for deletion.

[0010]Since this 3rd image processing device deletes both child objects of that object when it deletes an object, it can delete efficiently especially image attribute information and image data which are contained in an object to two or more objects.

[0011]The 4th image processing device of the image processing devices of this invention which attains the above-mentioned purpose, A memory measure performs Image Processing Division including generation processing of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and its picture, and image attribute information for a default was remembered to be, It has an object generating means which generates an object, and the object generating means is characterized by being what sets up as a default image attribute information memorized by object under generation at the above-mentioned memory measure.

[0012]Since this 4th image processing device sets predetermined image attribute information as an object under generation as a default, it can set up efficiently image attribute information showing the attribute of image data.

[0013]The 1st program storing medium of the program storing media of this invention which attains the above-mentioned purpose, Loading is carried out to a computer system and the computer system, Plurality by which a link was stretched so that it might become the layered structure form containing child-parent relationship, Come to memorize an image processing program operated as an image processing device which deals with an object in an object system which consists of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and its picture, and a described image processing program, Have an object generating means which newly generates an object, and the object generating means, In newly generating an object in which a parent object exists, it is characterized by being what sets image attribute information in the parent object as the new object under generation as a default.

[0014]The 2nd program storing medium of the program storing media of this invention which attains the above-mentioned purpose, Loading is carried out to a computer system and the computer system, Plurality by which a link was stretched so that it might become the layered structure form containing child-parent relationship, Come to memorize an image processing

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program operated as an image processing device which deals with an object in an object system which consists of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and its picture, and a described image processing program, It has an attribute changing means to change image attribute information of an established object, In changing image attribute information of an object in which child objects exist, the attribute changing means is characterized by being a thing which makes image attribute information changed about image attribute information of an object of a change target reflected in child objects of the object.

[0015]The 3rd program storing medium of the program storing media of this invention which attains the above-mentioned purpose, Loading is carried out to a computer system and the computer system, Plurality by which a link was stretched so that it might become the layered structure form containing child-parent relationship, . Deal with an object in an object system which consists of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and its picture, It is a thing which it comes to memorize an image processing program operated as an image processing device, A described image processing program is provided with an object deleting means which deletes an established object, and in deleting an object in which child objects exist, the object deleting means is characterized by being what also deletes child objects of an object for deletion.

[0016]The 4th program storing medium of the program storing media of this invention which attains the above-mentioned purpose, Loading is carried out to a computer system and the computer system, It is a thing which it comes to memorize an image processing program operated as an image processing device which performs Image Processing Division including generation processing of an object which has a pair with image attribute information showing the attribute of image data showing a picture, and its picture, A described image processing program is provided with an object generating means which generates an object, and is characterized by the object generating means being what sets predetermined image attribute information as an object under generation as a default.

[0017]Each program storing medium from the 1st to the 4th of the program storing media of this invention does so the same operation effect as each image processing device from the 1st to the 4th of the image processing devices of this invention. Although the same name was given to a component with an image processing device and a program storing medium, A device means what built software into hardwares, such as a thing constituted from hardware, or a general-purpose computer, for example, and realized a function as an image processing device of this invention, and a program means the software itself.

[0018]

[Embodiment of the Invention]Hereafter, the embodiment of this invention is described.

[0019]Drawing 1 is the outline view (A) and internal configuration figure (B) of a computer

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where one embodiment of the image processing device of this invention was realized.

[0020]As shown in drawing 1 (A) and drawing 1 (B), the computer 20, CPU11, CD-ROM drive 12, the memory 13, the hard disk 14, the mouse 15, the keyboard 16, and the display 17, It is the computer provided with the usual GUI (graphic user interface) function which the system bath 17 comes to connect, CD-ROM18 which memorized the program used for CD-ROM drive 12 of the computer 20 in the image processing device of this invention is inserted, If this image processing device will be in the state which can be employed and this installed program is started by installing that program on the hard disk 14, this computer system will operate as one embodiment of the image processing device of this invention.

[0021]Therefore, CD-ROM18 the image processing program was remembered to be is equivalent to one embodiment of the program storing medium of this invention.

[0022]Although CD-ROM18 is used as a program storing medium which memorizes the above-mentioned program in the computer 20 shown in drawing 1, The program storing medium of this invention is not what is restricted to CD-ROM, Program storing media, such as the other optical disc, a magneto-optical disc, a floppy disk, and magnetic tape, And internal storage, such as a hard disk drive in the state where the above-mentioned program was installed, is also included, and those program storing media in the state where the image processing program was memorized are also equivalent to one embodiment of the program storing medium of this invention.

[0023]Drawing 2 is a conceptual lineblock diagram of the image processing device with which appearance is shown in drawing 1.

[0024]The image processing device 10 shown in this figure consists of the information acquisition means 1, the image data storing means 2, the object generating means 3, the object deleting means 4, the attribution information alteration means 5, the object alteration means 6, the object memory measure 7, and the image data reading means 8.

[0025]Before explaining the details of the conceptual composition of this image processing device 10, Image Processing Division and an object are explained.

[0026]Image Processing Division here says adding a certain processing to the digital image data showing pictures, such as a photograph. An attribute is changed with the combination of processing with various digital image data. The list of the attributes by which digital image data is characterized is summarized as image attribute information.

[0027]Drawing 3 is a figure showing the kind of attribute contained in image attribute information.

[0028]The image size information which expresses the size of pictures, such as 320 pixels x 240 pixels, to image attribute information, for example, 256 colors (8 bits) and the image precision information [being full color (24 bits)] which expresses the accuracy of the color of a picture like. The attribution information of various kinds, such as compression technology

information showing compression technology, such as jpeg, color space information showing the kind of color space used as the base which specifies a color like RGB or CMYK, and platform information showing the kind of platform forms, such as the Intel form and the Motorola form, is included.

[0029]Drawing 4 is a figure showing the situation where the attribute of digital image data is changed by the conventional image processing device.

[0030]As shown in this figure, when changing the attribute of digital image data, the image attribute information set up in the analysis of that digital image data, etc. is used. As for this digital image data, while a storage location is managed, that storage location and predetermined image attribute information are matched. Conversion of the attribute of this digital image data is faced. They need to be managed by the information about each of data formats, such as TIFF, JPEG, DICOM, and PNG, and the information on each platform, and the above-mentioned digital image data. Image Processing Division is performed being controlled based on these information, and it is changed into the digital image data and image attribute information which have a new attribute.

[0031]Like attribute conversion of this digital image data, the complicated and complicated management and control according to various attribute contents are needed for Image Processing Division. However, in the image processing device of this embodiment, by the object which has a pair of digital image data and image attribute information being dealt with as a basic unit of Image Processing Division, the above-mentioned management and control are supported and Image Processing Division is efficiently performed so that it may explain below.

[0032]Next, the structure of one object is suitably explained with reference to drawing 5 - drawing 8, with drawing 5.

[0033]Drawing 5 is a figure showing the structure of an object.

[0034]As shown in drawing 5, the object links with the resource information showing digital image data and image attribute information. The details of resource information are shown in drawing 6.

[0035]Drawing 6 is a figure showing an example of the resource information of an object.

[0036]The information on the storage location of digital image data is included in resource information, and the digital image data stored in this storage location is equivalent to the digital image data which this object has. For example, the image size information of the image attribute information, image precision information, compression technology information and color space information, platform information, etc. are included in this resource information. Image attribute information and digital image data are matched by this resource information.

[0037]An object is classified so that it may belong to a group with the same character called a class as shown in drawing 7.

[0038]Drawing 7 is a figure showing an example of a classification of the class of an object. [0039]As shown in this figure, a class takes a layered structure. Have the layered structure here and the "core class" which is an uppermost hierarchy's class as a class of the hierarchy of the low rank of a "core class". It has the "picture class" which is a class of the object about the picture itself, and the "picture related data classes" containing a histogram, a look-up table, etc. A "picture class" has a "color picture (Colourimage) class", a "general picture (Generichimage) class", and "monochrome picture (Monochromelimage) class" as a low-ranking hierarchy's class.

[0040]If the classes to which an object belongs differ, the kinds of attribute of the image attribute information included in the resource information of an object may differ. However, in the layered structure of this class, a low-ranking hierarchy's class inherits the resource of the class of the hierarchy of a higher rank. That is, the kind of attribute which the image attribute information of the resource information a low-ranking hierarchy's class has includes the kind of attribute which the image attribute information of the resource information of the class of the hierarchy of a higher rank has.

[0041]As shown in drawing 5, the object links with the class information which is information about this class. Class information has a default resource which is the default of resource information to the object belonging to a class name and its class.

[0042]As shown in drawing 5, the object links with the image format peculiar resource showing the information on each of data formats, such as TIFF, JPEG, DICOM, PNG, etc. which are used for control of attribute conversion of digital image data, described by explanation of drawing 4.

[0043]As for an object, other objects and child-parent relationship are set up according to the operation from the outside. The child-parent relationship of an object here is not the child-parent relationship of the class of an object generally known but child-parent relationship of a concrete example (instance) of an object. This child-parent relationship is set up among two or more objects which usually belong to the same class. When this child-parent relationship is set up between objects and a certain object A has one or more child (Descendant) objects, the contents of one or more attributes of the resource information of the object A are inherited by those child objects -- those child objects -- resource information -- the contents of those attributes -- the same -- it will have the contents of the attribute. For those child objects, the object A is a parent (Parent) object and child objects other than the object B of the object A are brother (Sibling) objects for the one object B in those child objects. The object links with the parent (Parent) object, the child (Descendant) object, and the brother object.

[0044]An object has the information which has an object name for an object to be identified and shows the operating condition of a flag. When a flag is 1, it is shown that this object is in the situation currently used, and, below, it calls it setting a flag as "use" to set a flag to 1. When

a flag is 0, even if this object has information, including resource information etc., it is considered that it is intact and, below, it calls it setting a flag as "intact" to set a flag to 0. [0045]Drawing 8 is a figure showing the situation where the attribute of digital image data is changed by the image processing device of this embodiment.

[0046]In the point that digital image data and image attribute information are surrounded by the box of the solid line together, this figure differs from drawing 4. The box of this solid line expresses an object. The object which the box on the left-hand side of this figure expresses, Image attribute information is already set up and the storage location of digital image data is included, Image attribute information and the storage location of digital image data are matched as a result, and it links further with the information about the contents of each of data formats, such as TIFF, JPEG, DICOM, and PNG, and the information on each platform. Although details of the attribute changing of digital image data are given below, in the image processing device of this embodiment, it is that the information currently prepared for the inside of the object mentioned above is referred to, and attribute changing of digital image data is performed by making an object into a unit. Since such an object is used when taking the gestalt of software, the image processing device of this embodiment has the strong point of excelling in the maintenance and extension of a program with which general object oriented programming is provided.

[0047]Now, it returns to explanation of drawing 2 which is a conceptual lineblock diagram of the image processing device 10 using this object. On the occasion of change of the object attribute information included in generation, deletion, and resource information of an object information, including the attribute contents of the target object name, a class name, a parent object name, and resource information, etc., is acquired by the information acquisition means 1 according to a user's operation. Two or more digital image data is memorized by the image data storing means 2, and two or more objects are memorized at the object memory measure 7.

[0048]The object generating means 3 performs setting out of an object name, a class name, a parent object name, a flag, and resource information based on the information acquired by the information acquisition means 1, and generates an object. The generated object is stored in the object memory measure 7.

[0049]The object deleting means 4 reads the object of the object name used as the candidate for deletion acquired by the information acquisition means 1 from the object memory measure 7, and sets the flag of the object as "intact." The object set as "intact" is stored in the object memory measure 7. However, the object deleting means 4 can also actually delete the object of the object name used as the candidate for deletion according to a user's operation.

[0050]The attribution information alteration means 5 reads the object used as the change target of an attribute which has the object name acquired by the information acquisition means

1 from the object memory measure 7. The predetermined attribute contents of the resource information of the object are replaced according to the new attribute contents acquired by the information acquisition means 1. The object replaced by the new attribute contents is stored in the object memory measure 7.

[0051]The image data reading means 8 acquires an object name and an image data name from the information acquisition means 1 according to a user's operation. Read the object which has the object name from the object memory measure 7, and the digital image data which has the image data name is further read from the image data storing means 2. The attribute of the digital image data is analyzed and the analyzed attribute contents and storage location of the digital image data are applied to the resource information of the read object. The object which had resource information updated such is stored in the object memory measure 7.

[0052]The object alteration means 6 reads the object A which has digital-image-data A, and the object B which does not have digital image data from the object memory measure 7. Digital-image-data B which changed the digital image data of the object A according to the image attribute information of the object B is generated, and the object B is changed into the object which has digital-image-data B. The object B is stored in the object memory measure 7.

[0053]The details of the object generation by this image processing device 10, object deletion, and change of the attribute contents of an object are explained below using a flow chart.

[0054]Drawing 9 is a flow chart of object generation.

[0055]At Step S101, the information acquisition means 1 acquires the object name inputted by a user's operation, and the class name of an object. The information acquisition means 1 acquires a parent object name, when a parent object name is inputted by a user's operation, and further, when resource information is inputted by a user's operation, it acquires the resource information. The resource information to acquire may be information about some attributes of the various attributes contained in resource information. Next, it progresses to Steps S102-S106.

[0056]In Steps S102-S106, the object generating means 3 searches the object memory measure 7, and if it judges with the object for generation being the first object, it will newly generate an object. However, in this stage, the concrete contents of various kinds of information as shown in drawing 5 are not included in this object.

[0057]The object generating means 3 searches the child objects of an object with the parent object name from the object memory measure 7, when a parent object name is acquired by the information acquisition means 1. When there are some whose flag is "intact" among the searched child objects, the flag uses "intact" child objects as an object for generation. The case where an object with the acquired parent object name in the object memory measure 7 does not have child objects, Even if it has child objects, when all of the flag of all those child

objects are "used", the object generating means 3 generates the child objects of the object which newly has the acquired parent object name.

[0058]When the object for generation is not the first object and a parent object name is not acquired by the information acquisition means 1, the object generating means 3. The object memorized by the object memory information 7 is searched, the flag used discovers an "intact" object out of the searched object, and it is used as an object for generation. However, when the object which has an "intact" flag in the searched object does not exist, the object generating means 3 newly generates an object. Next, it progresses to Step S107.

[0059]As opposed to the object which the object generating means 3 generated at Steps S102-S106 in Step S107, The object name acquired by the information acquisition means 1 is set up, an object with the class of the class name acquired from the object memory measure 7 by the information acquisition means 1 is read, and the class information of the read object is set up. The object generating means 3 makes the object of the parent object name acquired by the information acquisition means 1 memorized by the object memory measure 7 link to the object for generation. The flag used of the object for generation is set as "use." Next, it progresses to Steps S108-S110.

[0060]In Steps S108-S110, when the parent object name is not acquired by the information acquisition means 1, the object generating means 3 sets up the default resource in the class information of the object for generation as resource information. Thus, the object to which resource information was set has the resource information of the same contents as this default resource.

[0061]Thus, since the image processing device of this embodiment has the resource information for a default according to the class to which the object for generation belongs and sets the resource information as the object as default resource information, Resource information is set up efficiently and an object can be generated efficiently.

[0062]When the parent object name is acquired by the information acquisition means 1, the object generating means 3 inherits the resource information of the object of the parent object name, and sets the resource information as the object for generation as a default. Thus, the object to which resource information was set has the resource information of the same contents as the resource information.

[0063]Thus, since the image processing device of this embodiment sets the resource information of the parent object as the object in which a parent object exists as default resource information, it sets up resource information efficiently and can generate an object efficiently.

[0064]Next, it progresses to Step S111.

[0065]In Step S111, when resource information is acquired by the information acquisition means 1, the resource information set up at Steps S108-S110 is in part or all replaced and set

up by this acquired resource information. Above, generation of an object is completed.

[0066]Drawing 10 is a flow chart of object deletion.

[0067]In Step S201, the object name of the object used as the candidate for deletion inputted according to a user's operation is acquired by the information acquisition means 1, and the object of the object name is read from the object memory measure 7 by the object deleting means 4. Next, it progresses to Step S202.

[0068]In Step S202, the flag used of the read object is changed into "it is intact" by the object deleting means 4. Next, it progresses to Steps S203-S204.

[0069]In Steps S203-S204, when the object deleting means 4 judges whether child objects exist in the object for deletion and child objects exist, the flags used of all the child objects are changed into "it is intact." Above, deletion of an object is completed.

[0070]Thus, since the image processing device of this embodiment deletes an object with the child objects of the object, Those objects can be especially deleted efficiently to two or more objects with the image attribute information and the image data which are contained in those objects.

[0071]Drawing 11 is a flow chart of attribute-contents change of an object.

[0072]In Step S301, the object name of the object used as the attribute changing object inputted according to a user's operation is acquired by the information acquisition means 1, and the object of the object name is read from the object memory measure 7 by the attribution information alteration means 5. The resource information which was inputted according to a user's operation and including new attribute contents is acquired by the information acquisition means 1. Next, it progresses to Step S302.

[0073]The above of the resource information of the object from which the attribution information alteration means 5 serves as an attribute changing object read from the object memory measure 7 in Step S302 – only the portion corresponding to new attribute contents is transposed to the new attribute contents, and is set up. Next, it progresses to Steps S303-S304.

[0074]It is judged whether in Steps S303-S304, child objects exist in the object from which the attribution information alteration means 5 serves as the above-mentioned attribute changing object, reading the child objects of the object which serves as the attribute changing object from the object memory measure 7, when child objects exist – the resource information of all the child objects – Step S302 – the same – the above – it transposes to resource information including new attribution information, and is set as it. Above, change of the attribute contents of an object is completed.

[0075]Thus, since the image processing device of this embodiment makes the image attribute information of an object reflect in the image attribute information of the child objects, it can change the image attribute information of those objects efficiently to two or more objects

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especially.

[0076]Next, the example which changes the size of digital image data is explained using the above-mentioned object generation. Here, the image processing device of this embodiment reads the multiple image of various data formats and various image sizes, and considers the case where the conversion process of all the pictures is collectively carried out to identical image size.

[0077]Drawing 12 is an example of a flow chart which changes the image size of two or more objects.

[0078]Drawing 13 is a figure showing the layered structure of the child-parent relationship of the object used with the flow chart of drawing 12.

[0079]As shown in drawing 12, in Step S401, the object generating means 3 generates the route object a1 shown in drawing 13. A parent object is not set up, but this route object a1 is set up belong to a general picture class, and the default resource of this general picture class is set up as resource information. All the objects used with this flow chart shall be set up belong to a general picture class. Next, it progresses to Step S402.

[0080]Step S402 – the above – the object generating means 3 generates the route source object a2 shown in various data formats and drawing 13, used as the parent object of the object which has a multiple image of various image sizes. As for this route source object a2, the route object a1 is set up as a parent object, and resource information inherits the resource information of this parent object. If the resource information in particular of each next object is not refused, it inherits the resource information of each parent object. Next, it progresses to Step S403.

[0081]The above shown in drawing 13 in Step S403 – the source object a3 which is an object which becomes a basis which reads the multiple image of various data formats or various image sizes is generated only for the predetermined number of pictures by the object generating means 3. As for these source objects a3, the route source object a2 is set up as a parent object. Next, it progresses to Step S404.

[0082]Step S404 – the image data reading means 8 – the above – two or more digital image data of each of various data formats and various image sizes – the source object a3 from the image data storing means 2 – it is alike, respectively and is read. Thus, the thing for which digital image data is read – the image data reading means 8 – the source object a3 – the image attribute information of the read digital image data is set as the image attribute information in each resource information. Next, it progresses to Step S405.

[0083]In Step S405, the route destination object a4 used as the parent object of two or more digital image data of identical image size shown in drawing 13 is generated by the object generating means 3. This route destination object a4, The route object a1 is set up as a parent object, the image size of the image attribute information included in resource information is set

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as 320 pixels x 240 pixels, and resource information other than image size inherits the resource information of a parent object. Next, it progresses to Step S406.

[0084]In Step S406, same number generation of the destination object a5 which is an object used as the basis which reads two or more digital image data of identical image size shown in drawing 13 is carried out by the object generating means 3 with the number of two or more of the digital image data. As for these destination objects a5, the route destination object a4 is set up as a parent object. Next, it progresses to Step S407.

[0085]. The object alteration means 6 is memorized by the object memory measure 7 in Step S407. the destination object a5 — the object of the couple which received and to which resemble, respectively, and each source object was made to correspond being read in order, and, The digital image data which changed the digital image data of the source object a3 of the objects of the couple according to the image attribute information of the destination object a5 of the objects of the couple is generated, The information on the storage location of the generated digital image data is given and changed into the destination object a5 of the object of the couple. By repeating this change, all the digital image data for conversion is changed into digital image data (320 pixels x 240 pixels). Next, it progresses to Step S408.

[0086]In Step S408, the object deleting means 4 deletes the route object a1. The route source object a2, all the source objects a3, the route destination object a4, and the destination object a5 are deleted with deletion of this route object a1.

[0087]Thus, in the image processing device of this embodiment, by an object unit, digital image data can be dealt with and the conversion process of two or more digital image data can be efficiently carried out using the character succession by the child-parent relationship and class of an object.

[Translation done.]

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- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.*** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is the outline view (A) and internal configuration figure (B) of a computer where one embodiment of the image processing device of this invention was realized.

[Drawing 2]It is a conceptual lineblock diagram of the image processing device with which appearance is shown in drawing 1.

[Drawing 3]It is a figure showing the kind of attribute contained in image attribute information.

[Drawing 4]It is a figure showing the situation where the attribute of digital image data is changed by the conventional image processing device.

[Drawing 5]It is a figure showing the structure of an object.

[Drawing 6]It is a figure showing an example of the resource information of an object.

[Drawing 7]It is a figure showing an example of a classification of the class of an object.

[Drawing 8]It is a figure showing the situation where the attribute of digital image data is changed by the image processing device of this embodiment.

[Drawing 9]It is a flow chart of object generation.

[Drawing 10]It is a flow chart of object deletion.

[Drawing 11]It is a flow chart of attribute-contents change of an object.

[Drawing 12]It is an example of a flow chart which changes the image size of two or more objects.

[Drawing 13]It is a figure showing the layered structure of the child-parent relationship of the object used with the flow chart of drawing 12.

[Description of Notations]

- 1 Information acquisition means
- 2 Image data storing means
- 3 Object generating means
- 4 Object deleting means

- 5 Attribution information alteration means
- 6 Object alteration means
- 7 Object memory measure
- 8 Image data reading means
- 10 Image processing device
- 11 CPU
- 12 CD-ROM drive
- 13 Memory
- 14 Hard disk
- 15_1 Mouse
- 15_2 Keyboard
- 16 Display
- 17 System bath
- 18 CD-ROM
- 20 Computer

[Translation done.]

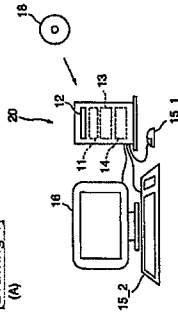
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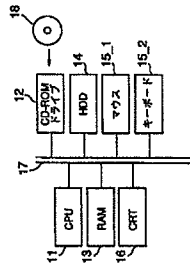
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DRAWINGS

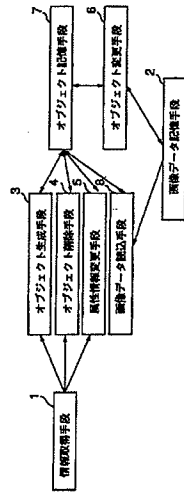
[Drawing 1]
(A)



(B)



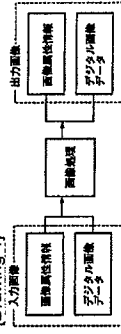
[Drawing 2]



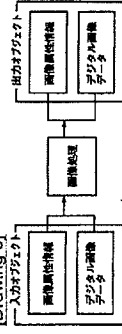
[Drawing 3]

画像サイズ (幅、高さ、帯域) 情報
画像精度 (14A24ビット) 情報
圧縮方式 (JPEG, Huffman, JAR, MMR, . . .) 情報
色空間 (RGB, CMYK, YCbCr, . . .) 情報
プラットフォーム (インテル形式, モトローラ形式, . . .) 情報

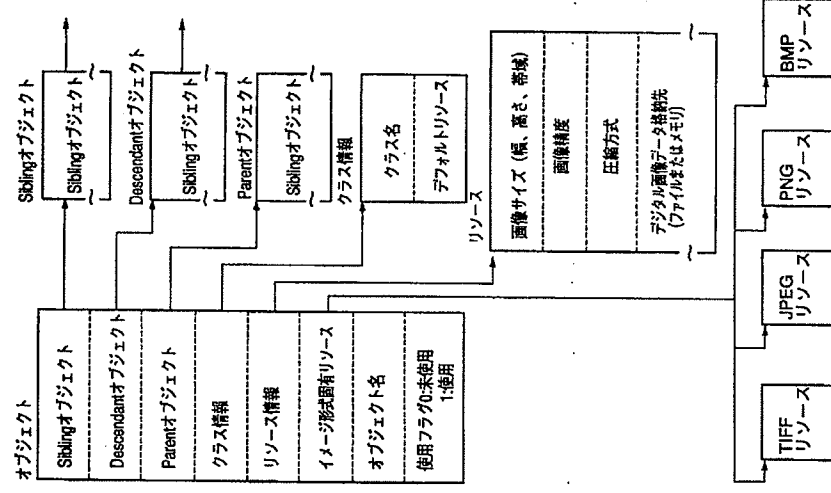
[Drawing 4]



[Drawing 8]



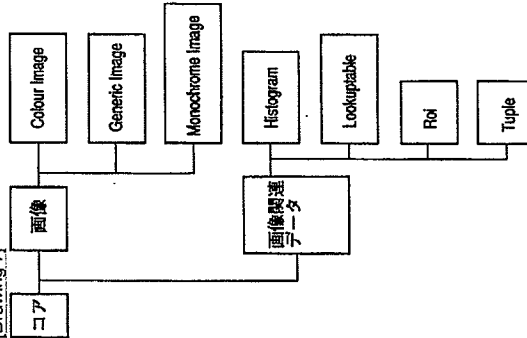
[Drawing 5]



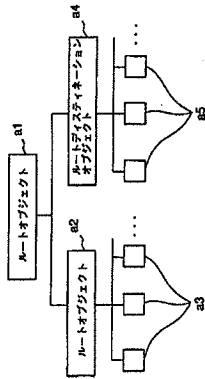
[Drawing 6]

画像サイズ (縦、横、帯域) 情報
画像形式 (1482x1024) 情報
圧縮方式 (JPEG, Huffman, ME, LZW, ...) 情報
圧縮サイズ情報
圧縮レベル情報
色空間 (RGB, CMYK, YCbCr, ...) 情報
カラーパレット情報
ピクセル単位 (White, Black, ...) 形式、ノンインタリープ形式、バイト単位情報
デジタルデータ 各種属性 (メモリまたはファイル)
ROI (Region-of-Interest) 情報
フラットフォーマット (インタール形式、モノローグ形式、...) 情報

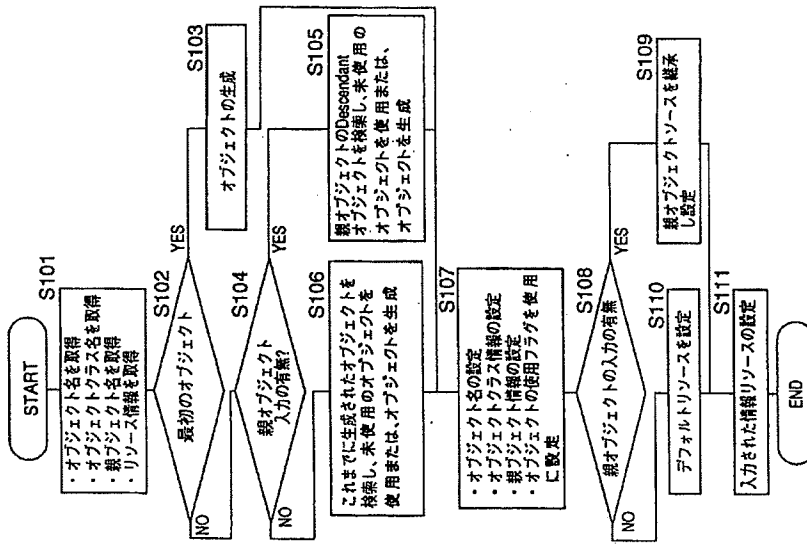
[Drawing 7]



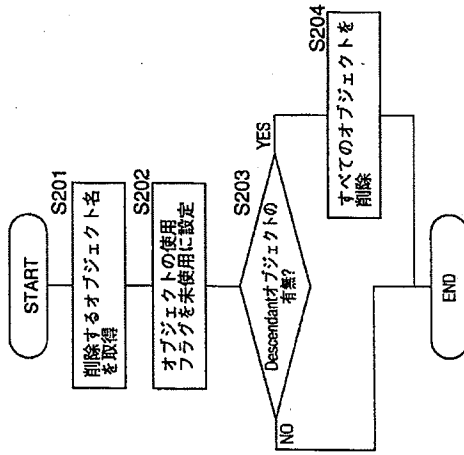
[Drawing 13]



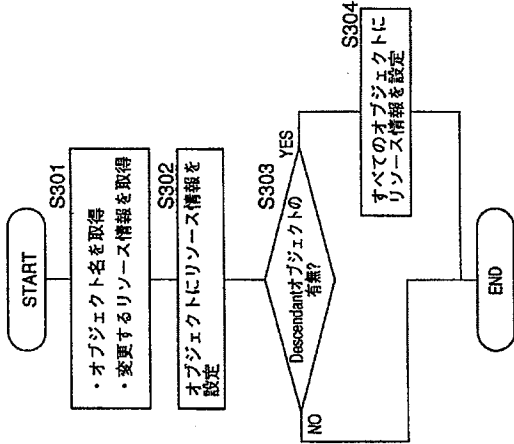
[Drawing 9]



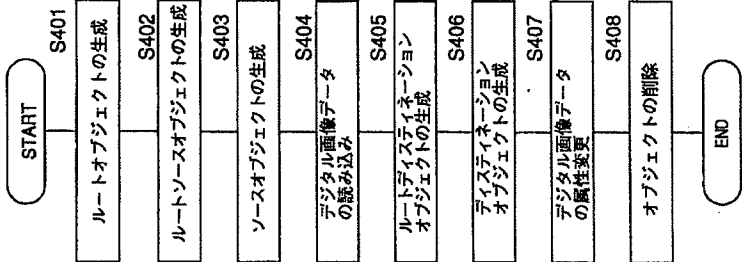
[Drawing 10]



[Drawing 11]



[Drawing 12]



[Translation done.]